Options remember picture and overlay with TikZ

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Arrows in a LaTeX document with TikZ
http://www.altermundus.com

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How to use `remember picture` and `overlay`

1. You need to place in your document a node

```
\tikz[baseline] \node[draw,fill=yellow,anchor=base] (n1){node}
```

   n1 is the name of the node.

2. In an second place, you create a second node

```
\tikz[baseline] \node[draw,fill=orange,anchor=base] (n2){node}
```

   n2 is the name of the last node.

3. Now, you need to connect the two nodes, we create a third picture with an option `overlay`.

```
\tikz[overlay]
\draw[->,>=latex,color=red,thick]%
(n1.east)--+(4,0)|-(n2.east);
```

4. And now, to produce a PDF, you need to use a driver thats supports picture remembering

A quick look in the pgfmanual

It is possible (but not quite trivial) to reference nodes in pictures other than the current one. This means that you can create a picture and a node therein and, later, you can draw a line from some other position to this node.
To reference nodes in different pictures, proceed as follows:

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1. You need to add the remember picture option to all pictures that contain nodes that you wish to reference and also to all pictures from which you wish to reference a node in another picture.
2. You need to add the overlay option to paths or to whole pictures that contain references to nodes in different pictures. (This option switches the computation of the bounding box off.)

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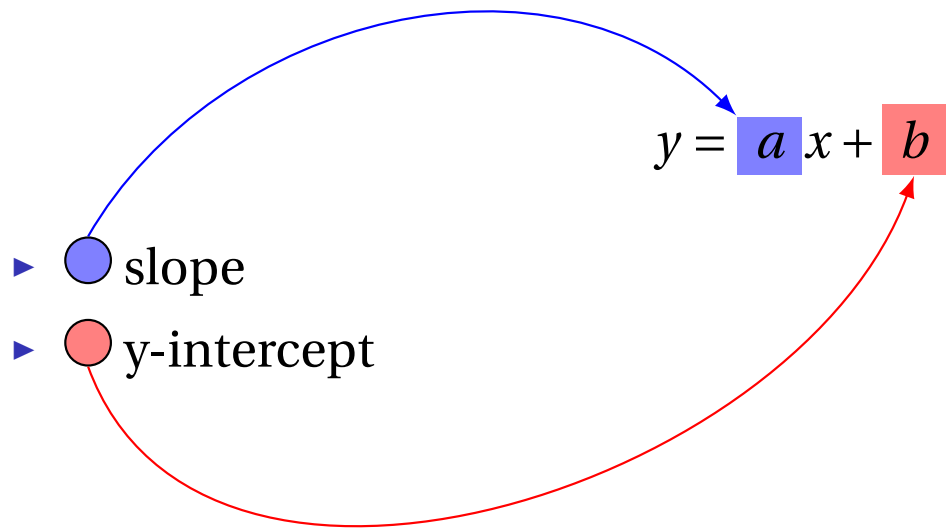
1. You need to add the remember picture option to all pictures that contain nodes that you wish to reference and also to all pictures from which you wish to reference a node in another picture.
2. You need to add the overlay option to paths or to whole pictures that contain references to nodes in different pictures. (This option switches the computation of the bounding box off.)
3. You need to use a driver that supports picture remembering (currently, this is only pdfTEX). With the pdfTEX driver you also need to run TEX twice.

Example N°2

This example was inspired by an example of Kjell Magne Fauske
http://www.fauskes.net/pgftikzexamples/global-nodes/.
With PGF1.18, it is possible to draw paths between nodes across different pictures. We can connect different nodes placed on different pictures.

One of the most useful form of straight-line equations is the "slope-intercept" form:



Write the last code on the blackboard

```
 {\tikzstyle{every picture}+=[remember picture]
\[  y =  \tikz[baseline]{\node[fill=blue!50,anchor=base] (t1){$a$};} x +
       \tikz[baseline]{\node[fill=red!50,anchor=base ] (t2){$b$};}
\]

  \begin{itemize}
      \item \tikz\node [fill=blue!50,draw,circle] (n1) {};\ slope
      \item \tikz\node [fill=red!50,draw,circle] (n2) {};\ y-intercept
  \end{itemize}
  \begin{tikzpicture}[overlay,>=latex]
          \path[blue,->] (n1.north) edge [out= 60, in= 135] (t1.north west);
          \path[red,->] (n2.south) edge [out=-70, in=-110] (t2.south);
  \end{tikzpicture}
}
```

Processing

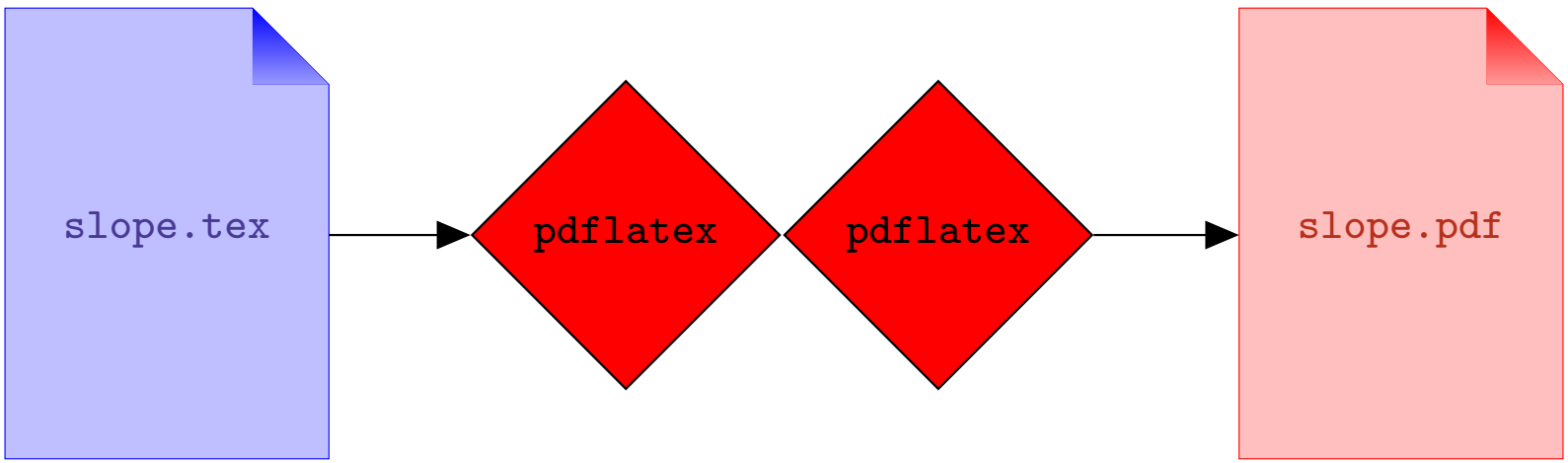
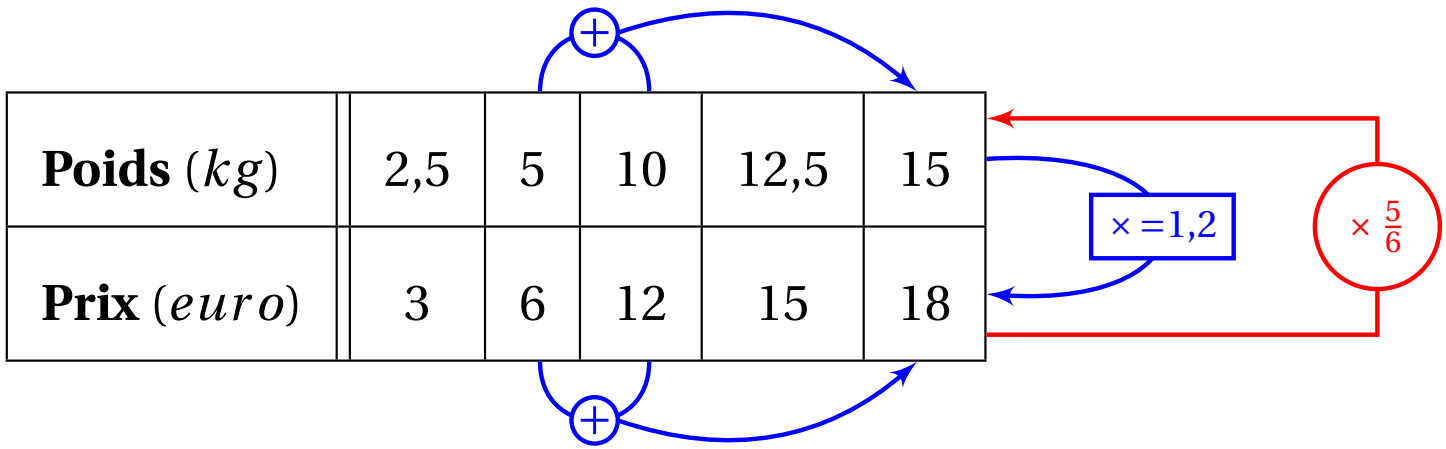


Table and proportion



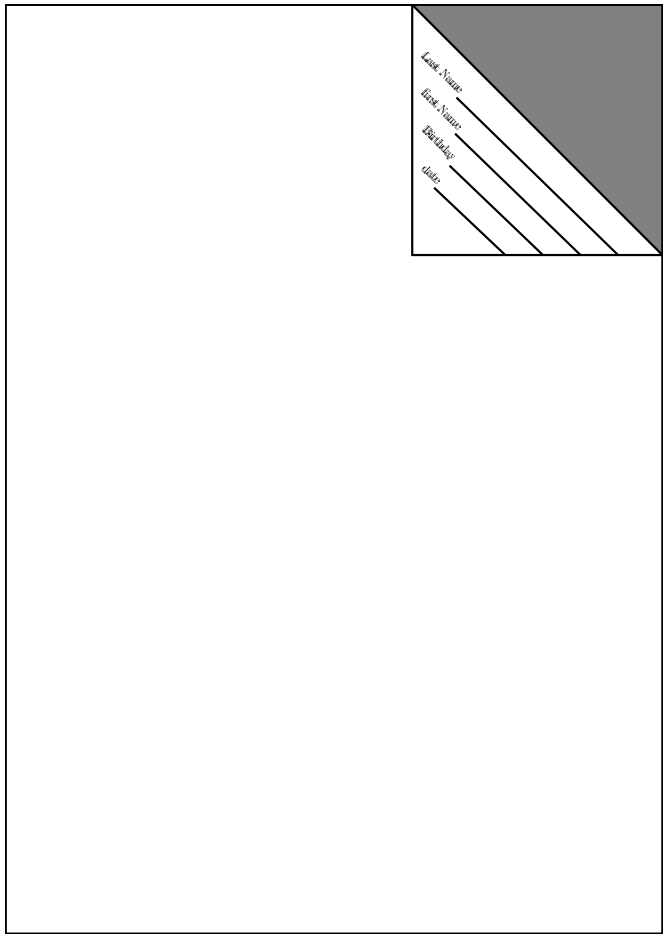
Write the last code on the blackboard (Part one)

```
 \begin{tikzpicture}[>=latex']
  \tikzstyle{ancre}=[inner sep = 0pt,%
                     outer sep = 0pt]
  \node[anchor = south west,rectangle,ancre](wr){%
\renewcommand{\arraystretch}{2}
\begin{tabular}{|l||c|c|c|c|c|}
  \hline
  \textbf{Poids} $(kg)$  & 2,5 & 5 & 10 & 12,5 & 15\\
  \hline
  \textbf{Prix} $(euro)$ & 3   & 6 & 12 & 15   & 18\\
  \hline
\end{tabular}};
% north arrows
\path (wr.north west) -- (wr.north east) %
  coordinate[pos=0.55](wrn1)
  coordinate[pos=0.66](wrn2)
  coordinate[pos=0.93](wrn3);
\draw[-,line width=.8pt,blue](wrn1) ..%
 controls +(+0cm,.5cm) and +(+0cm,.5cm)..%
 node[circle,fill=white,draw,pos=.5,blue,%
      fill=white,text=blue,ancre](wrn4){$+$}(wrn2);
\draw[->,line width=.8pt,blue](wrn4.east) to [bend left]%
      node[above]{} (wrn3.north);
```

Write the last code on the blackboard (Part two)

```
% south arrows
\path (wr.south west) -- (wr.south east)%
  coordinate[pos=0.55](wrs1)
  coordinate[pos=0.66](wrs2)
  coordinate[pos=0.93](wrs3);
\draw[-,line width=.8pt,blue!80](wrs1) ..%
controls +(+0cm,-.5cm) and +(+0cm,-.5cm)..%
 node[circle,fill=white,draw,pos=.5,blue,%
      fill=white,text=blue,ancre](wrs4){$+$}(wrs2);
\draw[->,line width=.8pt,blue](wrs4.east) to [bend right]%
       (wrs3.south);
% east arrows
\path (wr.north east) -- (wr.south east)%
  coordinate[pos=0.10](Rs)
  coordinate[pos=0.25](Cs)
  coordinate[pos=0.50](Rt)
  coordinate[pos=0.75](Ce)
  coordinate[pos=0.90](Rb)
  coordinate(Rx) at ([xshift=2.5cm] Rt);
\draw[->,line width=.8pt,blue]%
      (Cs) .. controls +(1.5cm,.1cm) and +(1.5cm,-.1cm)..
      node[fill=white,draw]{$\scriptstyle\times\,1{,}2$} (Ce);
\draw[->,line width=.8pt,red](Rb) -| ( Rx)
      node[circle,fill=white,draw]{$\scriptstyle\times\,\frac{5}{6}$}|-(Rs);
\end{tikzpicture}
```

An other example : Exam Sheet



The code to place this pdf picture is below :

```
\begin{figure}[htbp]
 \centering
 \includegraphics[scale=.2]%
            {examsheet.pdf}
 \caption{exam sheet}
\end{figure}
```

On the next page, you will find the code to build the exam sheet. It is necessary to use anchor of the current page. `current page.south west` and `current page.north east` are used with the `remember picture` option.

Figure: exam sheet

Write the last code on the blackboard
Define the exam sheet

```
\documentclass[a4paper]{article}
\usepackage{tikz}
\begin{document}
 \thispagestyle{empty}
 \begin{tikzpicture}[remember picture, overlay]
\draw[line width=2pt]%
 (current page.south west) rectangle (current page.north east);
\node [shift={(-8 cm,-8cm)}]  at (current page.north east)
{\begin{tikzpicture}[remember picture, overlay,line width =2pt]%
\draw(0,0) rectangle (8,8);
\draw [fill=gray] (0,8) -- (8,8) -- (8,0) -- cycle ;
\path[coordinate]
\foreach \k in {1,...,4}{%
  (0 pt,8cm -\k *1.2cm) coordinate (d\k)} ;
\path[clip] (0,0) rectangle (8,8);
\foreach \k/\t in {1/Last Name,2/First Name,3/Birthday,4/date}{%
\node[inner sep=0pt,rotate=-45,%
      right=0.5cm,minimum height=12pt](f\k) at (d\k) {\t};
\draw  (f\k.south east)-- (8cm -\k * 1.2cm,-6pt );}
\end{tikzpicture}};
\end{tikzpicture}
\end{document}
```

A strange frame

```
\begin{tikzpicture}[line width=2pt,remember picture, overlay]
\draw%
 (current page.south west) rectangle (current page.north east);
\draw[red] (current page.south west) to (current page.north east);
\draw[red] (current page.north west) to (current page.south east);
\end{tikzpicture}
\end{document}
```

Overlays and global nodes

A new example of Kjell Magne Fauske

```
this is some code;
second statement;
third statement;
another statement;
```

Overlays and global nodes

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Overlays and global nodes

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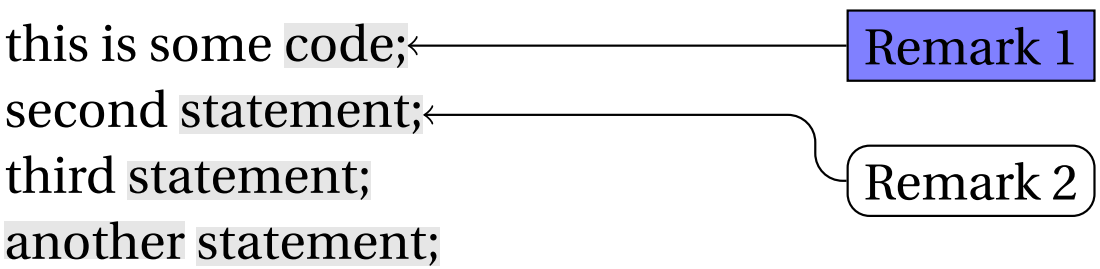

Overlays and global nodes

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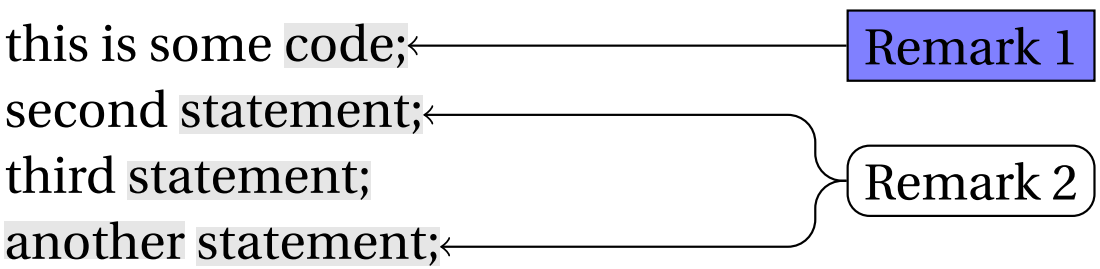

Overlays and global nodes

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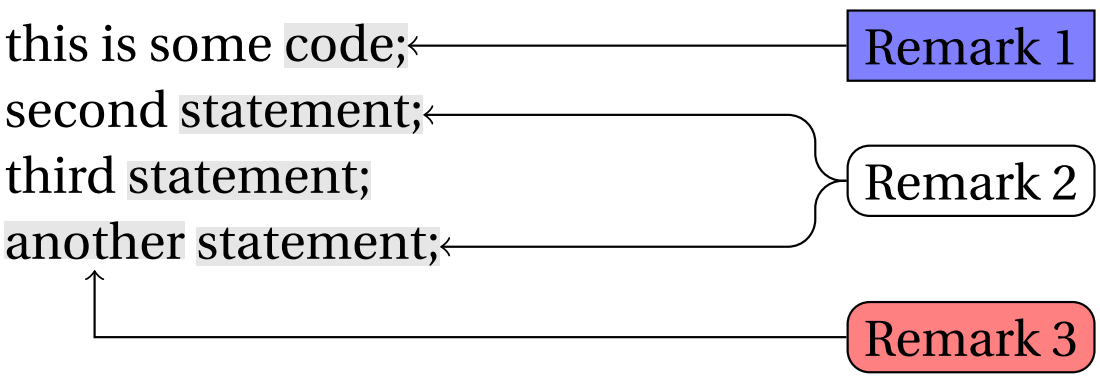

Write the last code on the blackboard

```
\tikzstyle{every picture}+=[remember picture]
\newcommand{\nann}[2]{%
    \tikz[baseline] {\node[anchor=base,inner sep=0pt,%
                      outer sep=0pt,fill=black!10] (#1) {#2};}}

       this is some \nann{code}{code;}\\
       second \nann{code2}{statement;}\\
       third \nann{code4}{statement;}\\
       \nann{code5}{another} \nann{code3}{statement;}\\
\tikz[overlay]\path<2->(code) ++(4,0) node[draw,fill=red!20](c1){Remark 1};
\tikz[overlay]\path<3->(code4 -| c1.west)%
     node[right,draw,fill=red!20,rounded corners] (c3) {Remark 2};\\
\tikz[overlay]\path<5->(c3.west)++(0,-1)%
      node[right,draw,fill=red!20,rounded corners] (c5) {Remark 3};\\

\begin{tikzpicture}[overlay]
    \draw<2->[->]  (c1) -- (code);
    \draw<3->[->,rounded corners=5pt] (c3.west) -- ++(-0.2,0) |- (code2);
    \draw<4->[->,rounded corners=5pt] (c3.west) -- ++(-0.2,0) |- (code3);
    \draw<5->[->,shorten >=2pt] (c5.west) -- ++(-0.2,0) -| (code5);
\end{tikzpicture}
```

Decomposition of a resolution

You need to use the linknodes.sty package

$$
\begin{aligned}
3(x^2-3) &= 4 \\
x^2-3 &= \frac{4}{3} \\
x^2 &= \frac{13}{3} \\
x &= \pm\sqrt{\frac{13}{3}}
\end{aligned}
$$

Decomposition of a resolution

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$$3(x^2-3)=4 \quad \div 3$$
$$x^2-3=\frac{4}{3}$$
$$x^2=\frac{13}{3}$$
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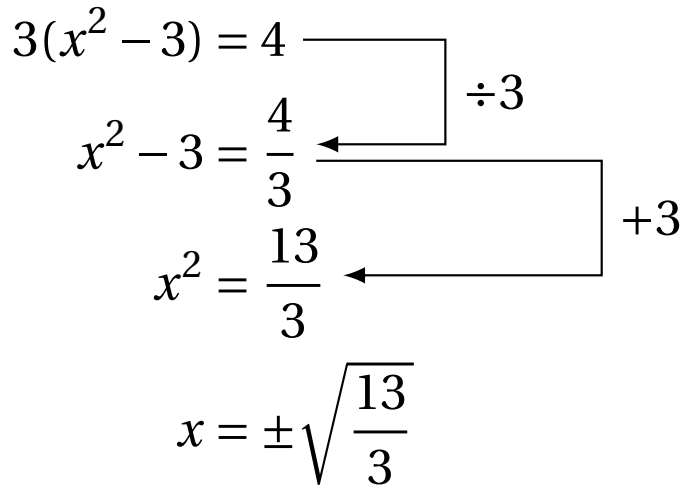

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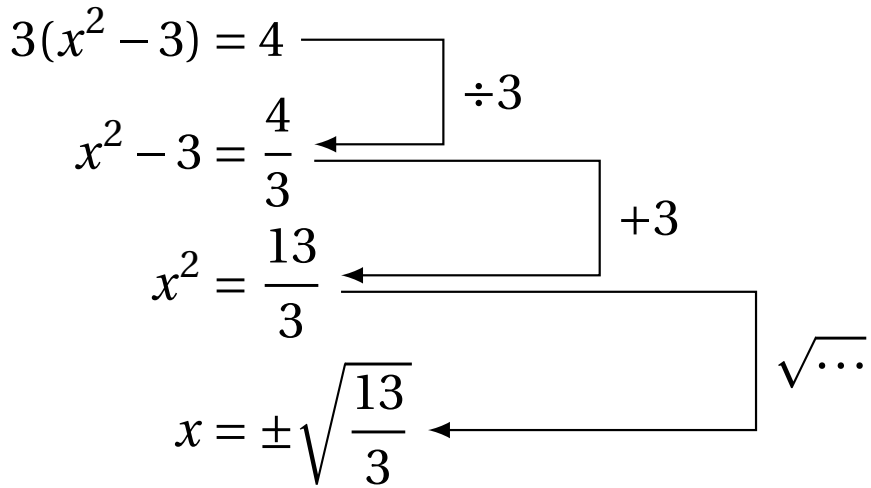

Write the last code on the blackboard

```
\begin{NodesList}
 \begin{displaymath}
   \begin{aligned}
     3(x^2-3) &=4                                  \AddNode\\
       x^2-3  &=\frac{4}{3}                        \AddNode\\
       x^2    &=\frac{13}{3}                       \AddNode\\
       x      &= \pm\sqrt{\frac{13}{3}}            \AddNode%
     \end{aligned}
 \end{displaymath}
\only<2->{\LinkNodes[marge=4 cm]{$\div 3$}}
\only<3->{\LinkNodes[marge=3 cm]{$+3$}}
\only<4->{\LinkNodes{$\sqrt{\ldots}$}}
\end{NodesList}
```

Decomposition of a resolution Exemple N°2

$$y = \begin{cases} x^2 + 2x & \text{if } x < 0, \\ x^3 & \text{if } 0 \leq x < 1, \\ x^2 + x & \text{if } 1 \leq x < 2, \\ x^3 - x^2 & \text{if } 2 \leq x. \end{cases}$$

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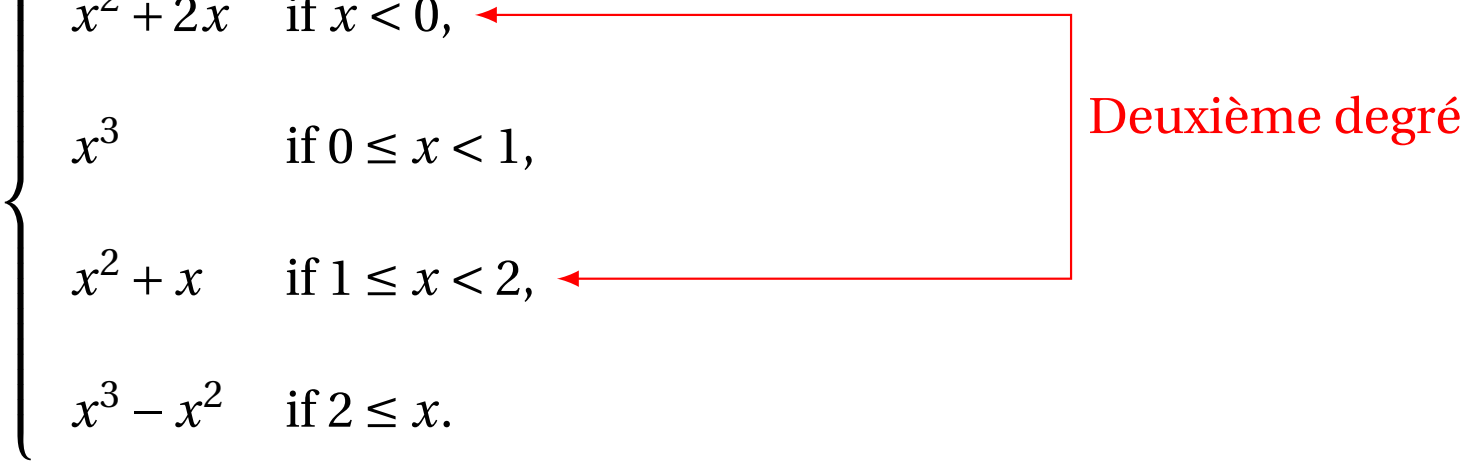

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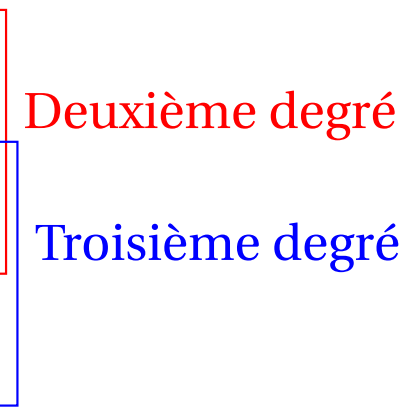

Write the last code on the blackboard

```
\begin{minipage}{11cm}
{\renewcommand{\arraystretch}{2}%
\begin{NodesList}[marge=.75\linewidth]
$
  y = \left\{%
   \begin{array}{ll}
     x^2+2x  &\textrm{if }x<0,                                  \AddNode   \\
     x^3     &\textrm{if }0\le x<1,                             \AddNode[2]\\
     x^2+x   &\textrm{if }1\le x<2,                             \AddNode   \\
     x^3-x^2 &\textrm{if }2\le x.                              \AddNode[2]
   \end{array}%
  \right.
$
\tikzstyle{ArrowStyle}+=[<->,red]
\tikzstyle{LabelStyle}+=[pos=0.20]
\only<2->{\LinkNodes[]{Deuxième degré}}
{\tikzstyle{ArrowStyle}+=[<->,blue]
\only<3->{\LinkNodes[]{Troisième degré}}}
\end{NodesList}
}
\end{minipage}
```